

OIL ANALYSIS REPORT

Sample Rating Trend

WEAR



Machine Id 4495 Component

Fluid

Diesel Engine PETRO CANADA DURON XL SYN BLEND 15W40 (38 LTR)

SAMPLE INFORM	NATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0091624	GFL0077617	GFL0070676
Sample Date		Client Info		14 Sep 2023	08 May 2023	13 Mar 2023
Machine Age	hrs	Client Info		30012	1138872	29069
Oil Age	hrs	Client Info		550	1138827	590
Oil Changed		Client Info		Changed	Changed	Changed
Sample Status				ABNORMAL	NORMAL	ABNORMAL
CONTAMINAT	ON	method	limit/base	current	history1	history2
Fuel		WC Method	>6.0	<1.0	<1.0	<1.0
Glycol		WC Method		NEG	NEG	0.0
WEAR METALS	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185(m)	>100	16	10	24
Chromium	ppm	ASTM D5185(m)	>20	<1	0	<1
Nickel	ppm	ASTM D5185(m)	>2	<u> </u>	2	A 3
Titanium	ppm	ASTM D5185(m)		1	<1	<1
Silver	ppm	ASTM D5185(m)	>2	0	0	0
Aluminum	ppm	ASTM D5185(m)	>25	5	2	4
Lead	ppm	ASTM D5185(m)	>40	3	<1	1
Copper	ppm	ASTM D5185(m)	>330	3	2	4
Tin	ppm	ASTM D5185(m)	>15	<1	<1	<1
Antimony	ppm	ASTM D5185(m)		0	<1	0
Vanadium	ppm	ASTM D5185(m)		0	0	0
Beryllium	ppm	ASTM D5185(m)		0	0	0
	1010			•	0	
Cadmium	ppm	ASTM D5185(m)		0	0	0
Cadmium ADDITIVES			limit/base			
ADDITIVES		ASTM D5185(m)	limit/base	0	0	
ADDITIVES Boron	ppm	ASTM D5185(m)	1	0 current	0 history1	history2
ADDITIVES Boron Barium	ppm ppm	ASTM D5185(m) method ASTM D5185(m)	1	0 current 25	0 history1 2	<mark>history2</mark> 2
ADDITIVES Boron Barium Molybdenum	ppm ppm ppm	ASTM D5185(m) method ASTM D5185(m) ASTM D5185(m)	1 1 60	0 current 25 0	0 history1 2 0	history2 2 0
ADDITIVES Boron Barium Molybdenum Manganese	ppm ppm ppm ppm	ASTM D5185(m) method ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	1 1 60	0 current 25 0 22	0 history1 2 0 57	history2 2 0 57
ADDITIVES Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm ppm	ASTM D5185(m) method ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	1 1 60 1	0 current 25 0 22 <1	0 history1 2 0 57 <1	history2 2 0 57 <1
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm ppm	ASTM D5185(m) method ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	1 1 60 1 1010	0 current 25 0 22 <1 782	0 history1 2 0 57 <1 924	history2 2 0 57 <1 914
Cadmium ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m) method ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	1 1 60 1 1010 1070	0 current 25 0 22 <1 782 1173	0 history1 2 0 57 <1 924 1054	history2 2 0 57 <1 914 1083
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m) method ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	1 1 60 1 1010 1070 1150	0 current 25 0 22 <1 782 1173 802	0 history1 2 0 57 <1 924 1054 1037	history2 2 0 57 <1 914 1083 1031
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m) method ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	1 1 60 1 1010 1070 1150 1270	0 current 25 0 22 <1 782 1173 802 880	0 history1 2 0 57 <1 924 1054 1037 1141	history2 2 0 57 <1 914 1083 1031 1138
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m) method ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	1 1 60 1 1010 1070 1150 1270	0 current 25 0 22 <1 782 1173 802 880 2502	0 history1 2 0 57 <1 924 1054 1037 1141 2560	history2 2 0 57 <1 914 1083 1031 1138 2507 <1
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINAN Silicon	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m) method ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	1 1 60 1 1010 1070 1150 1270 2060	0 current 25 0 22 <1 782 1173 802 880 2502 <1 current 9	0 history1 2 0 57 <1 924 1054 1037 1141 2560 <1 <1 history1 3	history2 2 0 57 <1
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m) method ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	1 1 60 1 1010 1070 1150 1270 2060 limit/base >25	0 current 25 0 22 <1 782 1173 802 880 2502 <1 current 9 8	0 history1 2 0 57 <1 924 1054 1037 1141 2560 <1 *1 history1 3 5	history2 2 0 57 <1
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m) method ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	1 1 60 1 1010 1070 1150 1270 2060 limit/base >25	0 current 25 0 22 <1 782 1173 802 880 2502 <1 current 9	0 history1 2 0 57 <1 924 1054 1037 1141 2560 <1 <1 history1 3	history2 2 0 57 <1
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINAN Silicon	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m) method ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	1 1 60 1 1010 1070 1150 1270 2060 limit/base >25	0 current 25 0 22 <1 782 1173 802 880 2502 <1 current 9 8	0 history1 2 0 57 <1 924 1054 1037 1141 2560 <1 *1 history1 3 5	history2 2 0 57 <1
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m) method ASTM D5185(m) ASTM D5185(m)	1 1 60 1 1010 1070 1150 1270 2060 limit/base >25 >20	0 current 25 0 22 <1 782 1173 802 880 2502 <1 current 9 8 2	0 history1 2 0 57 <1 924 1054 1037 1141 2560 <1 * history1 3 5 <1	history2 2 0 57 <1
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINAN Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m) method ASTM D5185(m) ASTM D5185(m)	1 1 60 1 1010 1070 1150 1270 2060 imit/base >25 >20 imit/base	0 current 25 0 22 <1 782 1173 802 880 2502 <1 current 9 8 2 2 current	0 history1 2 0 57 <1 924 1054 1037 1141 2560 <1 history1 3 5 <1 history1	history2 2 0 57 <1

DIAGNOSIS

Recommendation

The oil change at the time of sampling has been noted. We recommend an early resample to monitor this condition.

🔺 Wear

Nickel ppm levels are abnormal. Exhaust valve wear is indicated.

Contamination

There is no indication of any contamination in the oil.

Fluid Condition

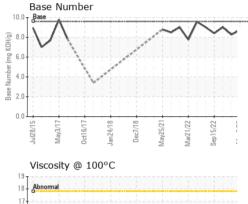
The BN result indicates that there is suitable alkalinity remaining in the oil. The oil is no longer serviceable as a result of the abnormal and/or severe wear.

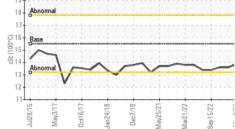


OIL ANALYSIS REPORT

🔺 Ferrous Allovs







FLUID DEGRADATION method limit/base current history1 history2 >25 16.0 14.8 Oxidation Abs/.1mm ASTM D7414* 15.3 Base Number (BN) mg KOH/g ASTM D2896* 9.6 6.95 8.72 8.26 VISUAL method limit/base current history history2 NEG NEG NEG Emulsified Water >0.2 scalar Visual* NEG Free Water scalar Visual* NEG NEG **FLUID PROPERTIES** limit/base method current history1 history2 cSt 13.9 13.6 Visc @ 100°C ASTM D7279(m) 15.5 13.6 GRAPHS Iron (ppm) Lead (ppm) 250 100 200 80 150 60 1.01 ar 50 20 0 n15/77 /lav3/1 ul28/ Aluminum (ppm) Chromium (ppm) 50 50 Sever 40 40 30 30 10 10 n (ar)1/77 lav8/73 en15/77 /ar21/22 an15/77 0ct16/1 lec7/1 Aav3/ ul28/ Copper (ppm) Silicon (ppm) 40 Seven 300 60 la 200 ۲<u>ط</u> 40 Ab 100 20 0 Sep 15/22 May8/23 lav25/21 (ar)1/77 lct16/1 lec7/ 0ct16/1 Viscosity @ 100°C Base Number Base 20 10.0 KOH/g) 18 () 10 (100-0) Buu 6.0 cs ts 4.0 ase 2.0 10 0.0 Mar21/22 Sep15/22 Mav8/23 Dec7/18 Sep15/22 May8/23 lct16/1 Mav25/21 Mav3/1 Oct16/1 Aav75/D Mar21/22 //S//a/ 1/1/ June Jan 24/1 ul28/ : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9 GFL Environmental - 550 - Rocky View County Received : 19 Sep 2023 220 Carmek Blvd : GFL0091624 : 20 Sep 2023 Rocky View County, AB : 02583467 Diagnosed

: Bill Quesnel

Diagnostician

 Laboratory
 Test Package
 : MOB 2

 To discuss this sample report, contact Customer Service at 1-800-268-2131.

 Test denoted (*) outside scope of accreditation, (m) method modified, (e) tested at external lab.

 Validity of results and interpretation are based on the sample and information as supplied.

: 5644532

Contact: GFL Calgary calgarymaintenance@gflenv.com T: F: (403)369-6163

CALA

ISO 17025:2017 Accredited

Laboratory

Sample No.

Lab Number

Unique Number

Submitted By: GFL Calgary Page 2 of 2

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